Message Text

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FOLLOWING REPEAT STATE 161330 ACTION GENEVA TOKYO
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QUOTE

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TAGS:PARM, US, UR, CCD
SUBJECT:U.S. WORKING PAPER FOR PNE EXPERTS' MEETING AT CCD

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DISTO

1. FOLLOWING IS CLEARED TEXT OF U.S. WORKING PAPER ON ARMS CONTROL IMPLICATIONS OF PNES TO BE USED IN CONNECTION WITH INFORMAL CCD MEETING WITH PNE EXPERTS STARTING JULY 14:

BEGIN TEXT

------ WORKING PAPER

------ ARMS CONTROL IMPLICATIONS OF NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES (PNES)
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. . VERY EARLY IN THE DEVELOPMENT OF NUCLEAR EXPLOSIVES FOR MILITARY PURPOSES, SUGGESTIONS WERE MADE IN THE UNITED STATES FOR EXPLOITING THE UNIQUE FEATURES OF SUCH EXPLOSIVES FOR ENGINEERING APPLICATIONS. SEVERAL POSSIBLE

APPLICATIONS HAVE SUBSEQUENTLY BEEN IDENTIFIED AND EXAMINED. MUCH OF THE EFFORT IN THE FIELD OF NUCLEAR ENGINEERING, AT LEAST IN THE UNITED STATES, HAS FOCUSED ON METHODS FOR THE RECOVERY OF DEEPLY SEATED ENERGY RESOURCES, SUCH AS STIMULATION OF NATURAL GAS WELLS AND IN-SITU RETORTING OF OIL FROM SHALE ROCK FORMATIONS. METHODS HAVE ALSO BEEN STUDIED FOR RECOVERING MINERALS FROM ORE FORMATIONS THAT CANNOT BE MINED BY CONVENTIONAL MEANS, SUCH AS THE USE OF NUCLEAR EXPLOSIVES TO BREAK UP THE ORE BODIES FOR SUBSEQUENT EXTRACTION MINING OR IN-SITU LEACHING.

. . ANOTHER POSSIBLE APPLICATION IS THE USE OF NUCLEAR EXPLOSIONS FOR CREATING UNDERGROUND CAVITIES FOR STORING PETROLEUM, LIQUIFIED GAS, OR TOXIC WASTES. IN ADDITION TO THESE ENGINEERING APPLICATIONS, PURELY SCIENTIFIC APPLICATIONS OF NUCLEAR EXPLOSIONS HAVE BEEN EXPLORED. THESE HAVE INCLUDED PRODUCTION OF SUPER HEAVY ELEMENTS AND EXPERIMENTAL DETERMINATIONS OF EQUATIONS OF STATE IN REGIONS OF HIGH PRESSURE AND TEMPERATURE, REGIONS THAT ARE INACCESSIBLE WHEN CONVENTIONAL EXPLOSIVE TECHNOLOGY IS EMPLOYED. ALL OF THESE APPLICATIONS ARE COMMONLY REFERRED TO AS "CONTAINED PNES" BECAUSE THEY ARE CONDUCTED DEEP UNDERGROUND IN A FULLY CONTAINED MODE WITH SURFACE EFFECTS GENERALLY CONFINED TO GROUND MOTION RESULTING FROM THE EXPLOSION.

. . EARLY IN THE U.S. PNE PROGRAM CONSIDERABLE RESEARCH WAS DEVOTED TO THE POSSIBILITY OF USING NUCLEAR EXPLOSIVES TO CONSTRUCT HARBORS, CANALS, AND WATER RESERVOIRS AND TO PERSORM DIFFICULT CUTS IN MOUNTAINOUS TERRAIN FOR HIGHWAYS AND RAILROADS. SUCH "EXCAVATION" APPLICATIONS DIFFER FROM "CONTAINED" APPLICATIONS IN THAT THEY WOULD INVOLVE THE DYNAMIC RUPTURE OF THE EARTH'S SURFACE, THE FORHATION OF CRATERS, AND THE EJECTION OF DEBRIS, INCLUDING RADIOACTIVE MATERIALS. AS A RESULT OF THE ABSENCE OF PROMISING APPLICATIONS IN THE UNITED STATES, HEALTH AND SAFETY CONSIDERA-
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TIONS, ENVIRONMENTAL CONCERNS, QUESTIONS OF PUBLIC ACCEPTABILITY, AND THE CONSTRAINTS IMPOSED BY THE LIMITED TEST BAN TREATY, U.S. RESEARCH AND DEVELOPMENT IN NUCLEAR EXPLOSIVE ENGINEERING IN RECENT YEARS HAVE GENERALLY BEEN CONFINED TO CONTAINED APPLICATIONS.

. . IN ORDER TO BE SUITABLE FOR A PNE PROGRAM, NUCLEAR EXPLOSIVES MUST BE DESIGNED TO HAVE CERTAIN, SOMETIMES HIGHLY SPECIALIZED, CHARACTERISTICS. SINCE ONE OF THE PRINCIPAL RATIONALES FOR PNES IS THEIR POSSIBLE ECONOMIC ADVANTAGE OVER ALTERNATIVE TECHNOLOGIES -- AND BECAUSE THE COST OF THE EXPLOSIVES CAN BE EXPECTED TO BE A SIGNIFICANT PART OF THE TOTAL COST OF ANY NUCLEAR ENGINEERING

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PROJECT -- AN OBVIOUS AND IMPORTANT REQUIREMENT FOR THE EXPLOSIVES IS MINIMUM COST. THIS REQUIREMENT DICTATES THE MINIMUM FISSILE MATERIAL, TRITIUM, AND DEVICE COMPLEXITY THAT IS CONSISTENT WITH OTHER DESIGN REQUIREMENTS. ECONOMY WOULD BE A PARTICULARLY CRITICAL FACTOR IN DEVICE DESIGN IF THE NUMBER OF EXPLOSIONS IN A PNE PROGRAM WERE LARGE.
- . THE DIAMETER OF THE NUCLEAR EXPLOSIVE DEVICE SHOULD BE AS SMALL AS PRACTICABLE. THIS IS PARTICULARLY IMPORTANT FOR APPLICATIONS INVOLVING EXPLOSIONS DEEP UNDERGROUND, SINCE SMALL DIAMETER EXPLOSIVES CAN MINIMIZE THE CONSIDERABLE COST OF DRILLING EMPLACEMENT HOLES.

. . ADDITIONAL CRITERIA FOR NUCLEAR EXPLOSIVE DESIGN ARE THE AMOUNT AND NATURE OF THE RADIOACTIVITY PRODUCED. FOR GAS AND OIL STIMULATION, IT WOULD BE IMPORTANT TO HAVE AS SMALL AN AMOUNT OF TRITIUM AS POSSIBLE. FOR EXCAVATION, LOW TOTAL RESIDUAL RADIOACTIVITY WOULD BE A REQUIREMENT. FOR SOME OTHER APPLICATIONS, THERE MAY NOT BE A NEED FOR ANY RESTRICTION ON RADIOACTIVITY.

. . THE YIELD OF THE EXPLOSION IS, OF COURSE, ANOTHER CRITICAL CHARACTERISTIC OF DEVICES FOR ENGINEERING APPLICATIONS. THE MOST APPROPRIATE EXPLOSIVE YIELD WILL VARY FROM PROJECT TO PROJECT. THE U.S. HAS STUDIED HYPOTHETICAL PROJECTS WITH A WIDE RANGE OF YIELDS. FOR MOST APPLICATIONS, SAFETY AND ECONOMY REQUIRE THAT THE YIELD OF THE EXPLOSIVE BE HIGHLY PREDICTABLE.

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. AN ADDITIONAL REQUIREMENT IS RUGGEDNESS. DEPENDING ON THE APPLICATION, EXPLOSIVES MAY BE REQUIRED TO WITHSTAND SEVERE ENVIRONMENTAL CONDITIONS -- SUCH AS EXTREME TEMPERATURES, PRESSURES, AND ACCELERATIONS -- WITHOUT LOSS OF RELIABILITY.

. WHILE THESE CHARACTERISTICS ARE OBVIOUSLY ONLY ILLUSTRATIVE OF THE MANY DESIGN CRITERIA FOR NUCLEAR EXPLOSIVES FOR PEACEFUL PURPOSES, THEY ARE SUFFICIENT TO DEMONSTRATE THAT THE TECHNICAL FEASIBILITY AND ECONOMIC UTILITY OF MOST PNE APPLICATIONS ARE DEPENDENT ON HIGHLY ADVANCED DEVICE DESIGN AND PRODUCTION TECHNOLOGIES. ALTHOUGH THERE MAY BE SOME ENGINEERING APPLICATIONS WHOSE REQUIREMENTS COULD BE MET BY RELATIVELY SIMPLE DEVICES, THE PRODUCTION OF THE NECESSARY EXPLOSIVE DEVICES FOR MOST APPLICATIONS, GIVEN THEIR RIGID AND DEMANDING REQUIREMENTS, WOULD NOT BE POSSIBLE WITHOUT LONG DEVELOPMENT AND TESTING EXPERIENCE AND CONSIDERABLE EXPENSE.

. AS NOTED ABOVE, SOME OF THE REQUIREMENTS OF NUCLEAR EXPLOSIVES FOR ENGINEERING APPLICATIONS (E.G., MINIMUM

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COST, PREDICTABLE YIELD) ARE COMMON TO VIRTUALLY ALL APPLICATIONS, WHILE OTHER REQUIREMENTS VARY FROM PROJECT TO PROJECT. A DIVERSE PNE PROGRAM, THEREFORE, WOULD CALL FOR THE DEVELOPMENT OF DIFFERENT DEVICE DESIGNS FOR SPECIFIC USES. IN THE U.S., DESIGN EFFORT HAS CENTERED AROUND TWO BASIC TYPES OF NUCLEAR EXPLOSIVES FOR ENGINEERING APPLICATIONS -- A VERY CLEAN, PHYSICALLY LARGE EXPLOSIVE WITH LOW TOTAL RESIDUAL RADIOACTIVITIES FOR EXCAVATION, AND MORE RECENTLY A SMALL-DIAMETER, MINIMUM RESIDUAL TRITIUM EXPLOSIVE FOR GAS STIMULATION.

. . . . WHILE VARIATIONS IN TECHNICAL CHARACTERISTICS MAY EXIST AMONG NUCLEAR EXPLOSIVE DEVICES OPTIMIZED FOR SPECIFIC ENGINEERING USES AND TECHNICAL DIFFERENCES MAY LIKEWISE EXIST BETWEEN DEVICES OPTIMIZED FOR SUCH PEACEFUL APPLICATIONS AND DEVICES OPTIMIZED FOR MILITARY PURPOSES, IT IS IMPORTANT TO EMPHASIZE THAT ALL NUCLEAR EXPLOSIVE DEVICES, REGARDLESS OF THEIR INTENDED OR OPTIMAL APPLICATION, HAVE CERTAIN COMMON CHARACTERISTICS.

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. . THE MOST FUNDAMENTAL CHARACTERISTIC COMMON TO SUCH DEVICES IS THAT THEY RELEASE EXTREMELY LARGE AMOUNTS OF ENERGY FROM A RELATIVELY SMALL AND LIGHT PACKAGE IN A TIME PERIOD MEASURED IN MILLIONTHS OF A SECOND. BECAUSE OF THIS INHERENT FEATURE, NUCLEAR EXPLOSIVE DEVICES, WHETHER IN THEIR CRUDEST OR MOST HIGHLY SOPHISTICATED FORMS, TAKE ON MILITARY SIGNIFICANCE.

. . THE YIELDS CONTEMPLATED FOR NUCLEAR EXPLOSIVE ENGINEERING APPLICATIONS SPAN A YIELD RANGE THAT IS OF INTEREST FOR TACTICAL AND STRATEGIC NUCLEAR WEAPONS. MOREOVER, NUCLEAR EXPLOSIVE DEVICES THAT HAVE BEEN CONSIDERED BY THE U.S. FOR PEACEFUL APPLICATIONS TYPICALLY WEIGH BETWEEN A FEW HUNDRED POUNDS AND TENS OF THOUSANDS OF POUNDS, THEIR DIAMETERS RANGE FROM TWENTY CENTIMETERS TO TWO METERS, AND THEIR LENGTHS RANGE FROM ONE TO TEN METERS. THUS, ALTHOUGH THE CONFIGURATION OF SOME EXPLOSIVES CANNOT BE ADAPTED EASILY, IF AT ALL, TO CERTAIN MISSILE WARHEAD APPLICATIONS OR TO SOME OTHER SOPHISTICATED FORMS OF DELIVERY, ALL EXPLOSIVE DEVICES ENVISAGED FOR PEACEFUL APPLICATIONS ARE "TRANSPORTABLE" AND CAN BE CARRIED TO MILITARY TARGETS (WITH DIFFERING DEGREES OF EFFICIENCY) BY A WIDE VARIETY OF DELIVERY VEHICLES.

. . BECAUSE OF THESE BASIC CHARACTERISTICS, IT HAS NOT BEEN POSSIBLE -- AND WE SEE NO BASIS FOR BELIEVING THAT IT COULD BE POSSIBLE -- TO DEVELOP A "STRICTLY PEACEFUL" NUCLEAR EXPLOSIVE DEVICE, ONE NOT CAPABLE OF MILITARY APPLICATION. ALL EXISTING OR FORESEEABLE NUCLEAR EXPLO-

SIVE DEVICES DESIGNED FOR PEACEFUL PURPOSES COULD ALSO BE EMPLOYED IN SOME FASHION AS A WEAPON, ALTHOUGH SUCH DEVICES WOULD NOT NECESSARILY ADD SIGNIFICANTLY TO THE MILITARY CAPABILITY OF NUCLEAR WEAPONS TESTING STATES THAT ALREADY POSSESS A BROAD RANGE OF NUCLEAR WEAPONS DELIVERY SYSTEMS AND NUCLEAR EXPLOSIVE DEVICES WELL-SUITED TO THOSE SYSTEMS.

. . THE PRINCIPAL ARMS CONTROL OBJECTIVE CONCERNING PNES MIGHT BE EXPRESSED IN THE FOLLOWING WAY: TO ACHIEVE ADEQUATE ASSURANCE THAT A NUCLEAR EXPLOSION PRO-
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GRAM CARRIED OUT FOR PEACEFUL PURPOSES DOES NOT PROVIDE NUCLEAR WEAPONS-RELATED BENEFITS NOT OTHERWISE AVAILABLE TO THE STATE CONDUCTING THE PROGRAM. IT IS IMPORTANT TO CONSIDER WHETHER AND TO WHAT EXTENT THIS OBJECTIVE COULD BE ACHIEVED--BOTH IN THE CASE OF STATES THAT HAD PRE-VIOUSLY NOT DEMONSTRATED A NUCLEAR EXPLOSIVE CAPABILITY AND IN THE CASE OF EXISTING NUCLEAR WEAPON STATES.

------ IMPLICATIONS FOR "NON-NUCLEAR EXPLOSIVE STATES"

FOR STATES PREVIOUSLY WITHOUT A PROVEN (I.E. TESTED) NUCLEAR EXPLOSIVE CAPABILITY, THE CRITICAL QUESTION IS WHETHER A NUCLEAR WEAPONS CAPABILITY IS INEVITABLY ACHIEVED IN THE PROCESS OF CARRYING OUT A PNE PROGRAH. IN SUCH A CASE, THE UNAVOIDABLE CONSEQUENCE OF ANY TEST THAT RESULTS IN A NUCLEAR YIELD, REGARDLESS OF THE PARTICULAR CHARACT-ERISTICS OF THE DEVICE USED, IS TO PROVIDE THE TESTING STATE WITH CONFIDENCE IN THE EXPLOSIVE CAPABILITY OF A DEVICE THAT COULD BE USED AS A NUCLEAR WEAPON. REGARD-LESS OF WHATEVER ADDITIONAL INFORMATION USEFUL TO WEAPONS DEVELOPMENT COULD BE GAINED IN A SUCCESSFUL INITIAL TEST, THE CONFIRMATION OF THIS MINIMUM BUT CRITICAL LEVEL OF DEVICE PERFORMANCE (I.E., THE REALIZATION OF A NUCLEAR YIELD), AND THE EXISTENCE OF THE TECHNOLOGICAL BASE THAT WOULD BE REQUIRED FOR THIS ACHIEVEMENT, WOULD BE SUFFI-CIENT FOR CONSIDERING THE TESTING STATE TO POSSESS A NUCLEAR WEAPONS CAPABILITY.

' . WHILE AN INITIAL TEST WOULD BE ENOUGH TO DEMONSTRATE THAT CAPABILITY, IT IS OBVIOUS THAT A STATE WISHING TO MAKE USE OF NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES WOULD WANT TO CONTINUE ITS DEVICE DEVELOPMENT AND TEST-ING PROGRAM. HOWEVER, THE PROCESS OF IMPROVING NUCLEAR EXPLOSIVE DEVICES IN THE CONTEXT OF A PNE PROGRAM INEVITABLY IMPROVES SUCH A STATE'S WEAPONS CAPABILITY. ADVANCES IN DEVICE DEVELOPMENT, PARTICULARLY AT THE EARLIER AND MORE BASIC STAGES, ARE DIRECTLY TRANSFERABLE

FROM ONE APPLICATION TO THE OTHER.

IT HAS BEEN SUGGESTED THAT A RELIABLE DISTINCTION
CAN BE MADE BETWEEN A STATE WITH THE CAPABILITY TO
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CARRY OUT NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES AND A NUCLEAR WEAPON STATE. IN THIS CONNECTION, IT HAS BEEN ARGUED THAT THE CRITICAL FACTOR IS NOT THE DEMONSTRATED CAPABILITY TO DEVELOP AND USE NUCLEAR EXPLOSIVE DEVICES, BUT RATHER THE INTENTIONS OF THE COUNTRY INVOLVED. THE MAJOR PROBLEM WITH ANY APPROACH BASED ON INTENTIONS RATHER THAN CAPABILITIES IS THAT THE SECURITY OF ALL STATES WOULD BE DECREASED IF MANY STATES HAD NUCLEAR EXPLOSIVE CAPABILITIES, EACH QUESTIONING THE LONG-TERM RELIABILITY OF THE PEACEFUL PLEDGES OF THE OTHERS, PARTICULARLY DURING CRISIS SITUATIONS.

. . IT HAS ALSO BEEN SUGGESTED THAT IT MIGHT BE POSSIBLE TO PREVENT A STATE WITH A NUCLEAR EXPLOSIVE CAPABILITY FROM OBTAINING A USABLE NUCLEAR WEAPONS CAPABILITY BY RESTRICTING THE ACQUISITION OF DELIVERY SYSTEMS. HOWEVER, AS POINTED OUT ABOVE, NUCLEAR EXPLOSIVE DEVICES CAN BE CARRIED TO MILITARY TARGETS BY A WIDE RANGE OF EXISTING LAND, SEA, OR AIR VEHICLES--SEVERAL OF WHICH ARE WIDELY AVAILABLE, RELATIVELY UNSOPHISTICATED, AND
. DESIGNED FOR COMMERCIAL PURPOSES OR MILITARY PURPOSES OTHER THAN THE DELIVERY OF NUCLEAR WEAPONS.

. A THIRD THEORETICAL POSSIBILITY MIGHT BE TO RESTRICT THE TECHNICAL CHARACTERISTICS OF THE EXPLOSIVE DEVICES SO AS TO MAKE THEM UNSUITABLE FOR WEAPONS PURPOSES, AND TO DEVELOP RELIABLE PROCEDURES TO ENSURE THAT ALL DEVICES CONFORM TO THE AUTHORIZED SPECIFICATIONS. HOWEVER, AS IS POINTED OUT EARLIER, ANY NUCLEAR EXPLOSIVE DEVICE COULD BE EMPLOYED, ALTHOUGH NOT NECESSARILY OPTIMALLY, AS A WEAPON. NO TECHNICAL CRITERIA COULD THEREFORE BE DEVISED TO DISTINGUISH BETWEEN DEVICES HAVING ONLY PEACEFUL APPLICATIONS AND DEVICES WITH MILITARY APPLICATIONS. WHILE PLACING RESTRICTIONS ON DEVICE CHARACTERISTICS COULD BE EXPECTED TO REDUCE THE EFFICIENCY OF CERTAIN NUCLEAR WEAPON SYSTEMS UTILIZING THE CONSTRAINED DEVICES, IT MUST BE RECOGNIZED THAT SUCH SYSTEMS WOULD NONETHELESS ADD ENORMOUSLY TO THE MILITARY CAPABILITY OF A STATE THAT PREVIOUSLY HAD NOT POSSESSED NUCLEAR EXPLOSIVE DEVICES.

. A FOURTH THEORETICAL POSSIBILITY MIGHT BE TO PER-
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MIT "NON-NUCLEAR WEAPON STATES" TO CARRY OUT THEIR OWN PNE PROGRAM PROVIDED THEY WERE WILLING TO PLACE ALL SPECIAL NUCLEAR MATERIALS (SNM) UNDER EFFECTIVE PHYSICAL CONTROL AND TO WITHDRAW FROM SUCH A "SNM BANK" ONLY THE AMOUNT NECESSARY FOR ONE PNE APPLICATION AT A TIME. THE SERIOUS FAILING OF SUCH AN APPROACH IS THAT IT WOULD

ENABLE THE "PNE POWER" TO DEVELOP AND GAIN EXPERIENCE IN THE USE OF NUCLEAR EXPLOSIVE TECHNOLOGY, EVEN TO TEST AND REFINE DEVICES TAILORED TO THE SPECIFICATIONS OF AVAILABLE MILITARY DELIVERY VEHICLES. RESTRICTED ACCESS TO SNM WOULD BE THE ONLY FACTOR PREVENTING SUCH A STATE FROM ACQUIRING A STOCKPILE OF NUCLEAR WEAPONS IN A RELATIVELY SHORT PERIOD OF TIME.

. SUCH AN APPROACH COULD NOT PROVIDE A RELIABLE OR DURABLE BARRIER AGAINST THE SPREAD OF NUCLEAR WEAPONS. THE CLANDESTINE DIVERSION OR ACQUISITION OF EVEN SMALL QUANTITIES OF SNM WOULD BE A VERY SERIOUS MATTER, SINCE THE STATE WOULD ALREADY HAVE A PROVEN CAPABILITY TO USE THIS MATERIAL TO FABRICATE NUCLEAR EXPLOSIVES. EVEN WITH ABSOLUTELY INFALLIBLE SAFEGUARDS AND PHYSICAL SECURITY MEASURES, STATES MIGHT FEEL COMPELLED TO PREPARE FOR THE POSSIBILITY THAT SAFEGUARDS IN OTHER STATES WOULD BE CIRCUMVENTED OR THAT OTHER "PNE POWERS" MIGHT, ESPECIALLY IN A CRISIS SITUATION, ABROGATE A SAFEGUARDS AGREEMENT OR TAKE OVER A "SNM BANK." THEREFORE, EVEN IF IT DID NOT ACTUALLY RESULT IN THE DIVERSION OF DEVICES TO MILITARY APPLICATIONS, SUCH AN APPROACH COULD BE EXPECTED TO RESULT IN SERIOUS INSTABILITIES.

. EARLIER IN THIS PAPER, IT WAS SUGGESTED THAT THE PRINCIPAL ARMS CONTROL OBJECTIVE CONCERNING PNES SHOULD BE TO ACHIEVE ADEQUATE ASSURANCE THAT A NUCLEAR EXPLOSION PROGRAM CARRIED OUT FOR PEACEFUL PURPOSES DOES NOT PRO-VIDE NUCLEAR WEAPONS-RELATED BENEFITS NOT OTHERWISE AVAIL-ABLE TO THE STATE CONDUCTING THE PROGRAM. FOR STATES THAT HAVE NOT PREVIOUSLY DEMONSTRATED A NUCLEAR EXPLOSIVE CAPABILITY, THE FOREGOING CONSIDERATIONS SUGGEST THAT THIS OBJECTIVE CANNOT BE ACHIEVED. THERE APPEARS TO BE NO RELIABLE MEANS OF CONSTRAINING A "NON-NUCLEAR WEAPON
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STATE'S" PNE PROGRAM SO AS TO PREVENT THE ACQUISITION OF A NUCLEAR WEAPONS CAPABILITY (I.E., TO DISTINGUISH BETWEEN A "PNE POWER" AND A NUCLEAR WEAPON STATE). IT WOULD SEEM, THEREFORE, THAT THE OBJECTIVE OF PREVENTING THE SPREAD OF NUCLEAR WEAPONS WOULD BE INCOMPATIBLE WITH THE DEVELOPMENT BY NON-NUCLEAR WEAPON STATES OFANY NUCLEAR EXPLOSIVE DEVICE.

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. AT THE SAME TIME, IT IS GENERALLY UNDERSTOOD THAT
THESE WEAPONS DEVELOPMENT IMPLICATIONS OF PNES MUST NOT

PREVENT NON-NUCLEAR WEAPON STATES FROM SHARING IN THE
POTENTIAL BENEFITS OF PNE TECHNOLOGY. ACCORDINGLY,
ARTIILE V OF THE TREATY ON THE NON-PROLIFERATION OF
NUCLEAR WEAPONS ASSURES NON-NUCLEAR WEAPON STATES PARTIES

WHICH HAVE GIVEN UP THE OPTION TO DEVELOP ANY NUCLEAR
EXPLOSIVE DEVICE THAT THEY WILL NOT BE DENIED ANY PNE
BENEFITS THAT MAY BE REALIZED BY THE NUCLEAR WEAPON
STATES PARTIES TO THE TREATY. MOREOVER, AS WAS RECOG-
NIZED IN THE FINAL DECLARATION OF THE REVIEW CONFERENCE
OF THE PARTIES TO THE TREATY ON THE NON-PROLIFERATION OF
NUCLEAR WEAPONS SUCH BENEFITS COULD ALSO BE MADE AVAIL-
ABLE TO NON-NUCLEAR WEAPON STATES NOT PARTY TO THE TREATY.

------IMPLICATIONS FOR EXISTING NUCLEAR WEAPON STATES

ANY NUCLEAR EXPLOSIVE DEVICE, AS HAS BEEN POINTED OUT
ABOVE, COULD SERVE IN SOME FASHION AS A NUCLEAR WEAPON.
FOR AN EXISTING NUCLEAR WEAPON STATE (NWS), HOWEVER, THE
PRODUCTION OF A NUCLEAR EXPLOSIVE AND ITS USE IN A PEACE-
FUL APPLICATION WOULD NOT NECESSARILY FURNISH SIGNIFICANT
IMPROVEMENTS TO THAT STATE'S NUCLEAR WEAPON CAPABILITIES.
WHETHER OR TO WHAT EXTENT A PNE PROGRAM CARRIED OUT BY AN
EXISTING NWS WOULD CONTRIBUTE TO NUCLEAR WEAPONS CAPA-
BILITIES DEPENDS ON SUCH FACTORS AS THE BREADTH AND CHAR-
ACTER OF THAT STATE'S EXISTING NUCLEAR WEAPON CAPABILITIES,
THE LEVEL OF ITS PNE ACTIVITY COMPARED TO THE LEVEL OF ITS
WEAPONS TESTING PROGRAM, AND THE NATURE AND EFFECTIVENESS
OF THE CONSTRAINTS, IF ANY, ON ITS PNE PROGRAM.
IF THERE WERE NO CONSTRAINTS ON A NUCLEAR WEAPONS TEST-
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ING PROGRAM, A PNE PROGRAM WOULD BE OF NO PARTICULAR ARMS
CONTROL CONCERN. WHILE AN ACTIVE PNE PROGRAM MIGHT, OF
COURSE, RESULT IN SOME INCIDENTAL "SPIN-OFF" BENEFITS
TO THE WEAPONS PROGRAM, THERE WOULD BE LITTLE OR NO INCEN-
TIVE FOR USING PNES TO ACHIEVE WEAPON-RELATED BENEFITS
WHEN THE FULL RANGE OF WEAPON DEVELOPMENT AND TESTING
OPTIONS WAS AVAILABLE IN THE WEAPONS TESTING PROGRAM. IN-
DEED, IT WOULD PRESUMABLY BE DISADVANTAGEOUS TO DO SO,
SINCE A TEST CARRIED OUT EXCLUSIVELY FOR WEAPONS PURPOSES
CAN BE TAILORED TO ACHIEVE SUCH BENEFITS, WHEREAS SOME
PENALTY, IN TERMS OF THE ACQUISITION OF INFORMATION REL-
EVANT TO WEAPONS DEVELOPMENT, WOULD BE IMPOSED
ON THE TESTING POWER BY AN ENGINEERING APPLICATION. THERE-
FORE, IN THE CASE OF AN ONGOING AND UNRESTRICTED WEAPONS
TESTING PROGRAM, THERE WOULD APPEAR TO BE NO ARMS CONTROL

JUSTIFICATION FOR PLACING CONSTRAINTS ON A PNE PROGRAM. ARMS CONTROL QUESTIONS MAY BE RAISED, HOWEVER, IN THE EVENT OF RESTRICTIONS ON NUCLEAR WEAPONS TESTS. SPECIFICALLY, IF WEAPONS TESTING WERE CONSTRAINED AND PNE ACTIVITY WERE NOT CONSTRAINED, THE POTENTIAL WOULD BE CREATED FOR USING THE PNE PROGRAM TO REALIZE WEAPON-RELATED BENEFITS NO LONGER AVAILABLE IN THE WEAPONS TESTING PROGRAM. THEREFORE IN ORDER TO HAVE ADEQUATE CONFIDENCE THAT PNE PROGRAMS COULD NOT BE UTILIZED FOR

THAT PURPOSE, IT WOULD BE ESSENTIAL IN THE CONTEXT OF ANY RESTRAINTS ON NUCLEAR WEAPONS TESTS TO PLACE STRICT AND EFFECTIVE CONSTRAINTS ON PNES AS WELL.

THE QUESTION OF THE WEAPONS DEVELOPMENT AND TESTING IMPLICATIONS OF PNES HAS RECENTLY ARISEN IN CONNECTION WITH THE TREATY ON THE LIMITATION OF UNDERGROUND NUCLEAR WEAPON TESTS, WHICH WILL PROHIBIT NUCLEAR WEAPONS TESTING ABOVE A THRESHOLD OF 150 KILOTONS. ARTICLE III OF THIS TREATY CALLS FOR A SEPARATE AGREEMENT GOVERNING THE CONDUCT OF NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES. THIS PNE AGREEMENT IS CURRENTLY BEING NEGOTIATED BY THE UNITED STATES AND THE SOVIET UNION. WHILE IT IS TOO EARLY TO PREDICT THE CONTENT OF THE PNE AGREEMENT, BOTH SIDES AGREE THAT IT SHOULD CONTAIN ADEQUATELY VERIFIABLE CONSTRAINTS ON THEIR PNE PROGRAMS TO ENSURE THAT PNES DO NOT PROVIDE
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OPPORTUNITIES TO ACHIEVE WEAPON-RELATED BENEFITS PRECLUDED BY THE THRESHOLD TEST BAN TREATY. IT SHOULD BE NOTED THAT ANY PNE ARRANGEMENT THAT WOULD BE ADEQUATE FOR THE PRESENT THRESHOLD TEST BAN WOULD NOT NECESSARILY BE ADEQUATE FOR MORE RESTRICTIVE WEAPONS TESTING RESTRAINTS.

THE ULTIMATE EXTENSION OF WEAPONS TESTING RESTRICTIONS, IS, OF COURSE, A COMPREHENSIVE BAN ON NUCLEAR WEAPONS TESTS. UNLIKE A THRESHOLD AGREEMENT, A COMPREHENSIVE BAN WOULD PERMIT NO AUTHORIZED WEAPONS TESTING OPPORTUNITIES. FOR THIS REASON, INCENTIVES FOR SEEKING WEAPONS-RELATED INFORMATION IN THE COURSE OF A PNE PROGRAM WOULD BE MUCH GREATER THAN UNDER A THRESHOLD/PNE REGIME.

THE UNITED STATES IS FIRMLY COMMITTED TO ACHIEVING A COMPREHENSIVE TEST BAN AGREEMENT WITH ADEQUATE VERIFICATION PROVISIONS. IF PNES WERE TO BE ACCOMMODATED UNDER SUCH AN AGREEMENT, A VERIFICATION SYSTEM WOULD HAVE TO BE DEVISED THAT WOULD PROVIDE ADEQUATE ASSURANCE NOT ONLY THAT CLANDESTINE WEAPONS TESTS WERE NOT GOING UNDETECTED AND UNIDENTIFIED, BUT ALSO THAT WEAPON-RELATED BENEFITS WERE NOT BEING ACQUIRED FROM NUCLEAR EXPLOSIONS CARRIED OUT OPENLY AND OSTENSIBLY FOR PEACEFUL PURPOSES. TO

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ACHIEVE THE LATTER OBJECTIVE, A CONTROL SYSTEM, AT A MINI-
MUM, WOULD HAVE TO PREVENT THE TESTING OF A NEW WEAPON
CONCEPT, THE SUBSTITUTION OF A STOCKPILED WEAPON FOR THE
"PNE" EXPLOSIVE TO VERIFY ITS PERFORMANCE, AND THE CARRY-
ING OUT OF NUCLEAR WEAPONS EFFECTS STUDIES.

IN ADDITION, IT WOULD BE IMPORTANT TO TAKE INTO
ACCOUNT OTHER INFORMATION AND EXPERIENCE GAINED IN A PNE
PROGRAM THAT COULD BE OF MILITARY VALUE. FOR EXAMPLE, ANY
PNE PROGRAM COULD AID STATES CARRYING OUT THE PROGRAM IN
MAINTAINING RESEARCH, TESTING, AND INDUSTRIAL FACILITIES
ESSENTIALLY IDENTICAL TO THOSE USABLE FOR NUCLEAR WEAPONS
DESIGN, TESTING AND PRODUCTION AND IN RETAINING PERSONNEL
SKILLED IN THE DESIGN AND FABRICATION OF NUCLEAR EXPLO-
SIVE DEVICES FOR MILITARY AS WELL AS PEACEFUL APPLICATION.
THE PNE PROGRAM COULD ALSO INCREASE THE STATE'S TESTING
EXPERIENCE AS WELL AS ITS KNOWLEDGE OF HOW TO CALCULATE
THE PERFORMANCE OF NUCLEAR EXPLOSIVES, INCLUDING THE IM-
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PROVEMENT OF COMPUTER CODES USED IN SUCH CALCULATIONS.
THE EXTENT TO WHICH THESE FACTORS WOULD BE OF MILITARY
SIGNIFICANCE WOULD HAVE TO BE CONSIDERED IN EVALUATING
ANY SYSTEM FOR VERIFYING A CTB WITH A PNE ACCOMMODATION.

. FURTHER CONSIDERATION OF THESE DIFFICULT AND COMPLEX
VERIFICATION ISSUES COULD PROVIDE A BETTER UNDERSTANDING
OF HOW IT MIGHT BE POSSIBLE TO ACHIEVE ADEQUATE ASSURANCE
THAT NUCLEAR WEAPONS-RELATED BENEFITS WOULD NOT BE OBTAIN-
ED IF PNES WERE PERMITTED UNDER A COMPREHENSIVE
WEAPONS TEST BAN. END TEXT. INGERSOLL UNQUOTE

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Message Attributes

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Disposition Approved on Date:
Disposition Authority: KelleyW0
Disposition Case Number: n/a
Disposition Comment: 25 YEAR REVIEW
Disposition Date: 28 MAY 2004
Disposition Event:
Disposition History: n/a
Disposition Reason:
Disposition Remarks:
Document Number: 1975STATE161330
Document Source: ADS
Document Unique ID: 00
Drafter: ACDA/IR:REINHORN
Enclosure: n/a
Executive Order: N/A
Errors: n/a
Film Number: D750241-0997
From: STATE
Handling Restrictions: n/a
Image Path:
ISecure: 1
Legacy Key: link1975/newtext/t197507104/baaaaoti.tel
Line Count: 523
Locator: TEXT ON-LINE, TEXT ON MICROFILM
Office: ORIGIN ACDA
Original Classification: LIMITED OFFICIAL USE
Original Handling Restrictions: n/a
Original Previous Classification: n/a
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Reference: n/a
Review Action: RELEASED, APPROVED
Review Authority: KelleyW0
Review Comment: n/a
Review Content Flags:
Review Date: 22 OCT 2003
Review Event:
Review Exemptions: n/a
Review History: WITHDRAWN <03 APR 2003 by Izenbel0, RDFRD, REFER TO DOE>; RELEASED <22 OCT 2003 by KelleyW0>; APPROVED <22 OCT 2003 by KelleyW0>
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Review Media Identifier:
Review Referrals: n/a
Review Release Date: n/a
Review Release Event: n/a
Review Transfer Date:
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Status: NATIVE
Subject: n/a
TAGS: PARM, US, UR, CCD
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Type: TE
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